Internet:

The Undiscovered Country

by Andrew Kantor

The Internet is a hot topic. It has been seen on the front page of all sorts of newspapers and on the covers of national magazines. It has even been the topic of cartoons in *The New Yorker.*

But what is the Internet, really? Does it have value as a business tool? Should you use it? You can find lots of people anxious to tell you about the Internet, but precious few who can tell you how to use it effectively.

The Internet is a loose collection of millions of computers at thousands of sites around the world whose users can pass along information and share files no matter which of those computers they're using. Imagine an office network on a grand scale—with thousands of computers and terabytes of data instead of merely megabytes (a terabyte equals a million megabytes). But unlike an office network, there is no central authority on the Internet. The administrators have simply agreed to have their computers speak the same transmission language: Transmission Control Protocol/Internet Protocol (TCP/IP). That agreement has spawned a worldwide web of computers that are all connected.
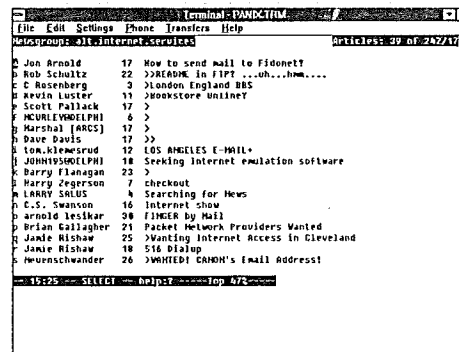
The Internet was not designed for the business user but was intended to serve the research and academic communities. Lately, though, business people, as well as government workers, educators, and just casual computer enthusiasts have been traversing this web. They have at least one thing in common: They search among the millions of pages of electronic data for the few bits that they want or need.

FROM THESE HUMBLE BEGINNINGS. . .

What is now the Internet began as an experiment to test the possibility of creating a disaster-proof nationwide

computer system where scientists and military personnel could share messages and data no matter where they were. In the late 1960s, the United States government connected four computers in California and Utah using what was then a new networking technology, called packet switching.

It worked. Users on these computers could send messages to and share files with other users almost instantaneously. The original project, called the ARPAnet, after the Advanced Research Projects Agency, which supervised the project, grew gradually for a long time, adding new computers and users at government and university sites.

From the alt.internet.services Usenet newsgroup. Listed are the writer's name, the length of the posting, and the subject of the article.

From the mid-1970s to the 1980s, smaller networks that used the ARPAnet technology, such as NSFnet, run by the National Science Foundation (NSF), decided to work together or *internetwork.* They started sending information to one another across special high-speed telephone lines, with the ARPAnet as the core. By the 1980s, this *internetwork* of computers reached not only across the country, but around the world. Today it links government, university, college, research, and commer-

cial sites, and is known around the world simply as *the Internet.*

No one person or group runs the Internet. Much of its direction, however, comes from a group of volunteers called the Internet Society, which is run more like a council of elders than a business. Two major subgroups of the Society are the Internet Architecture Board (IAB), which focuses on producing interconnection standards, and the Internet Engineering Task Force (IETF), which concerns itself with technological developments and their impact on the Internet. These volunteer groups hold public on-line discussions, where Internet users register their opinions and try to create standards for the Internet community. (Membership in the Internet Society is $70 annually for an individual.)

Similarly, no one organization collects fees from Internet users or networks. Each individual user and service pays its own way. The NSF still pays for NSFnet, and NASA pays for the NASA Science Internet. Many university and commercial sites maintain their own computer systems; some pay a regional network or national provider for their data connections. Some sites are supported by private grants, others by government funding. Somehow it all works.

And it all grows, too. In fact, Internet growth is phenomenal. Reports released at the Internet World '93 conference held in New York this past December put the Internet global population at 15 million, with 150,000 new members joining every month.

INFORMATION EVERYWHERE

You can find every conceivable kind of information on the Internet. The business user might be interested in infor-

mation on—and copies of—GATT (General Agreement on Tariffs and Trade), NAFTA (North American Free Trade Agreement), or the Maastricht Treaty. You can find demographic statistics, consumer news, or copies of the Japan Economic Newswire. Using the Internet, you can even connect to, say, the United States Department of Commerce's Economic Bulletin Board.

Not only are there news wires and databases of all kinds, there are mailing lists and discussion groups of regular users, along with experts in all walks of life, who gather electronically to contribute additional information and debate its merits.

Electronic mail is the mainstay of the Internet. It works like regular postal mail, but it's faster and—if you send more than a few messages a month—it's cheaper too. Each site on the Internet has a unique name, such as panix.com (for the commercial system Panix in New York), or unix.cc.emory.edu (for the Emory University computer center's Unix system). Each user at each site has a user name, so the entire address reads something like *president@whitehouse.gov* (pronounced "president at white house dot gov"). And many systems that offer little in the way of Internet access, such as CompuServe or Prodigy, at least have mail gateways for users to send or receive Internet mail.

Electronic mail lets you reach a lot of people at once through *mailing lists*. Mailing lists are like forums—groups of people who share an interest, such as steel production, or Ray Bradbury books, or medical research, for example. When you subscribe to a list, rather than sending a message to individual users, you send it to the list. Your message is automatically copied to all the other subscribers, and you get a copy of whatever they write. It's a crude but effective cross between a chain letter and a shouting match.

Aside from e-mail and mailing lists, the Internet has another method of fostering communications and discus-

sion. Called Usenet News, it is the Internet's equivalent of bulletin boards. If you participate, you will have at your disposal "newsreader" programs, with names like rn, nn, or trn (for read news, no news is good news, and threaded read news).

You can subscribe to newsgroups and post messages and replies to more than 4,500 bulletin board–like groups around the world. These are divided
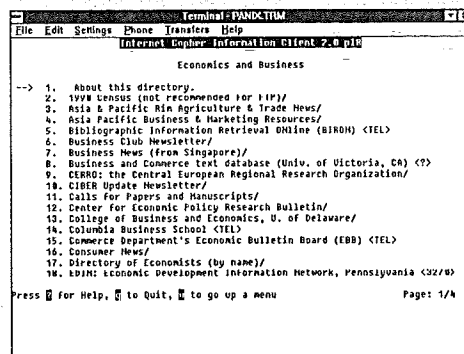
Gopher is one of the Internet's easiest navigational tools to use. Users explore by making selections from a series of numbered menus.

into topic areas that include biz (for business postings), comp (for computer-related), and alt (a variety of miscellaneous topics and social issues). Individual boards have names like *alt.movies* or *comp.lang.c++*.

Users can join as many newsgroups or subscribe to as many mailing lists as they like, but most find that keeping up with even a few is time consuming. The problem is that hundreds, or thousands, of messages a day are posted in the most popular groups or lists. Your mailbox can fill quickly.

Think of mailing lists as magazines—you subscribe and unsubscribe as your needs and interests change. Then newsgroups are like television stations: They are always there, and you can flip through them, deciding at a glance whether you want to read what you see.

SIGN ON

To use the Internet, of course, you must first be connected. There are a few ways to accomplish that.

First, you can be directly connected

to one of the networks that constitute the Internet. Most universities, and more and more companies, have direct Internet connections, often through connections to a major access provider such as Performance Systems International (PSI) in Reston, Virginia. This is an expensive solution, requiring, among other things, a router and a leased T1 or T3 link, but it does give you complete control over your access. This includes your site name, what tools you will have available, and which newsgroups you will make available to users.

A more cost-effective method may be to find one of the country's hundreds of dial-up providers, which will provide you with an account or group of accounts. Once established, you dial in to the provider's computer, which is attached to the Internet (and which typically runs Unix). Dial-up providers usually charge under $25 per month for an account, and, in the Internet tradition (which most adhere to), most make the fee a flat rate. That means there are no additional charges for the number of e-mail messages you send or the amount of time you spend on-line.

You can also access the Internet indirectly, through gateways provided by the big commercial services (the focus of this article). America Online, CompuServe, Dow Jones/MCI, GEnie, and Prodigy all offer at least e-mail exchange with Internet users. America Online, CompuServe, and Prodigy both plan to allow you to subscribe to mailing lists, join news groups, search databases, and transfer binary files sometime this year.

LOOKING AROUND

Getting connected is the easy part. Finding what you need is hard. Because the Internet was built by and for sophisticated computer users it hasn't had the benefit of the kind of tools most business users have come to appreciate on their own computers. Still there are some tools that work for Internet users, and some emerg-

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Internet

ing tools that hold promise.

If you are looking for a specific file on the Internet, start with archie. Archie depends on archie servers, which keep a frequently updated record of what's available on every Internet computer. In fact, these servers are really big indexes, and archie allows you to search across them for the file you want.

Like any search tool, archie takes practice. But the Internet is so dense that you probably will have special problems. For example, if you want information on Lotus Improv you'd better be specific. Searching on just *Lotus* will turn up everything from Lotus tech notes to information on yoga positions.

Once you find a file using archie you can typically retrieve it using another tool called File Transfer Protocol (FTP). FTP lets you use a series of Unix commands to navigate through the remote computer, find the correct file, and retrieve it. You have to know the correct series of Unix commands, but the tool does work.

The archie/FTP combination is good for experienced users, or for users searching for a specific file or files. But when you are searching for a topic area or just browsing, Gopher and the World-Wide Web (WWW) are better. These navigators let you browse, in an orderly fashion, through millions of files stored on the Internet using a series of menus. Gopher uses a direct, topic-to-topic approach. A search tool called VERONICA allows you to search *Gopherspace* for information, making the two a powerful combination. Alternately, WWW links specially designed hypermedia documents, as well as Gopher directories, FTP sites, and even newsgroups. It's rapidly becoming one of the most popular tools on the Internet.

If the information you need has been indexed in a database, a program called WAIS (Wide-Area Information

Server), developed by Thinking Machines, will let you search first for appropriate databases and then for information within them. The last of the major Internet tools is telnet, which is not so much a tool as a way to access them. Telnet lets you attach to any other computer on the Internet to run programs, search databases, or just log on to a personal account you have there.

Although all of these tools are functional, they are not user-friendly. It would appear, though, that the next generation of Internet tools is about to emerge. One new Internet navigator that *is* friendly is Mosaic, a free software program that was developed by the National Center for Supercomputing Applications. It's available for download from the Internet.

There are both Windows and Macintosh versions available of Mosaic, and they sport the kind of point-and-click interface people have come to expect in their software. Unfortunately, Mosaic will not work through simple Internet gateways, such as those offered by CompuServe or MCI. Instead, it requires a direct Internet connection, or a dedicated high-speed phone line.

Ironically, right now, some of the best tools for using the Internet are books and newsletters about it, because the more you know before you start, the less time you'll spend once you go on-line.

For newcomers, John Levine's *The Internet for Dummies* (IDG Books, 800-762-2974) provides an excellent introduction to the Internet itself and the various tools used for reaching it. A step up is Ed Krol's *The Whole Internet User's Guide & Catalog* (O'Reilly & Associates, 800-998-9938), and a good reference to keep

handy is Daniel Dern's *The Internet Guide for New Users* (McGraw-Hill, 212-512-2000). Business users will appreciate Mary J. Cronin's *Doing Business on the Internet* (Van Nostrand Reinhold, 800-842-3636). Also recommended are *The Internet Letter* (Net Week, 800-638-9336), and *Internet World* magazine (Meckler Corp, 800-632-5537).

Unfortunately, there's no general catalog of information on the Internet; you'll have to search for what you want. Searching involves learning and using one of the Internet's search tools we've just described, or paying someone up to $100 per hour to do it for you. There's no guarantee you'll find what you want, either. On a commercial on-line service, profit motive provides continuous pressure to keep data plentiful and approachable; on the Internet the information you find is there only because of someone's good will.

All of the Internet search tools are functional, but they are not user-friendly. However, the next generation of tools is about to emerge.

All of the hype and the increased popularity that has resulted may drive the development of the kind of software tools business users need to use the Internet effectively. Or, they may kill it. Despite the fact that the Internet is, according to Peter Lewis in *The New York Times,* "about as easy for a novice to use as traveling a muddy road on a pogo stick with signs written in Unix," traffic is way up, and as a result the system has begun to slow down noticeably, especially during business hours.

The Internet does not bill for use, and there is no built-in way to keep track of its users. How well the Internet adapts to this explosion of interest will likely determine if it can indeed act as an on ramp to the national data highway, or whether it will be just another bypass. □